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logical sciences, a philosophy which is true "sub specie æternitatis," though it deals with human experience, with social and ethical institutions, ideals, crises, and tangles.

The problems of philosophy are more than historical episodes—critical junctures in the "developing situation" of a given culture epoch. They are that, but they are also more. They get their sting and vitality from no merely historical situation; their significance does not cease in a different historic epoch. The typical human experiences summed up and crystallized in any one of the *permanent* human interests do not *wholly* change. The *form* of the experience, and hence of the problem, remains constant. Likewise, the complete answer, always sought for, would be in the shape of a proposition whose truth is not subject to time. Let us say, if we will, that such problems are insoluble, such truth for the most part inaccessible (that it is not wholly so *vide* mathematics and logic), but to say this is not to relegate them to a realm of secondary and idle problems.

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SOCIETIES

SECTION OF ANTHROPOLOGY AND PSYCHOLOGY OF THE NEW YORK ACADEMY OF SCIENCES

REPORT OF THE SECRETARY

A JOINT meeting was held with the New York Branch of the American Psychological Association on November 25, 1907. An afternoon session was held at the psychological laboratory of Columbia University, and an evening session at the American Museum of Natural History. The Section nominated to the Council of the Academy the following as its officers for 1908: Chairman, Dr. Adolf Meyer; Secretary, Professor R. S. Woodworth.

Professor E. L. Thorndike reported some work on "Memory for Paired Associates," in which he has found that German-English vocabularies can be learned with a speed far in excess of what is regarded as possible in the usual teaching of a foreign language, and retained much better than would be expected from the results of Ebbinghaus on nonsense material.

Mr. G. H. Betts, in studying the "Correlation of Visual Imagery with College Standing," has been unable to detect any positive correlation. The relation seems to be a purely chance one.

Dr. E. W. Scripture described a method used in "Experiments

on the Subconsciousness, with Demonstration of Jung's Method of Detecting Emotional Complexes." After mentioning his own early experiments on the association of ideas, the speaker described some work he had lately done with Dr. Jung in the Psychiatric Institute at Zurich, in which, following Jung's method, the subject gives associates with given words; the time is taken, and the subject is also required afterwards to repeat his former associations from memory. The presence of an emotional complex is indicated by slowness, forgetfulness, superficiality or unusualness of associates, etc. The emotional complexes so revealed are often causes of mental depression, anxiety, excitability, neurasthenia, and hysteria. Contrary to Jung, the speaker did not believe them causes also of *dementia precox*.

Dr. Scripture also demonstrated a method for the "Detection of the Emotions by the Galvanometer." The subject held his hands on large plate electrodes, and after the beam reflected from the mirror of the galvanometer had come to rest, emotions aroused in the subject would cause deflection. Reviewing the original discovery of Tarchanoff and the recent work of Peterson and Jung, the speaker concluded that the cause of the deflection lay in increased activity of the sweat glands.

Dr. J. Carleton Bell reported his experiments on the "Effect of Suggestion upon the Reproduction of Triangles and of Point Distances." The subject was required to reproduce the height of a given triangle, for instance, in the presence of figures higher or lower than the required height. In the first third of the experiments each of the six observers gave evidence of being influenced by both high and low suggestion, the low being the more effective. There were striking individual differences in the susceptibility to suggestion. As the experiments proceeded, the observers seemed to become habituated to the suggestion, so that the effect grew less and less marked.

Professor F. L. Tufts described his "New Spectrophotometer for the Study of Color Vision." The problem of determining the relative luminosity of lights of differing color is fraught with difficulty. Three methods have been used, but as they do not give perfectly concordant results, each depends on its own definition of what shall be regarded as equal luminosity. The three definitions are the following: (1) Two similar surfaces, illuminated by two lights of different color, may be said to be of equal luminosity if, in the judgment of the observer, they appear equally luminous. (2) Two similar surfaces, white, with black markings on them, illuminated by two lights of different color, may be said to be of equal luminosity if, when placed at the same distance from the eye, the details can be distinguished with the same minuteness. (3) Two similar surfaces,

illuminated by two lights of different color, are said to be of the same luminosity if, on rapidly replacing one by the other before the eye, there is no sensation of flickering. The author has modified the flicker photometer of Rood so as to use spectral colors. A white disk, rotating between the telescope and the prism of a spectroscope, is cut away for half of its circumference, so as to admit the colored ray from the prism for half of the time, while for the other half it reflects white light from a lamp the distance of which is adjustable along a photometer bar. By moving the lamp along the bar a point is found at which there is no flicker between the white and the colored lights. In this way the luminosity of different parts of the spectrum can be determined with reference to a given white. The relative luminosity of different parts of the spectrum was not changed by fatiguing the eye to one color. Though the eye be fatigued to green by several minutes' exposure to it, so that gray objects appear purple, yet the green of the spectrum has the same luminosity relatively to the other parts of the spectrum as when the eye is fresh. (An exception must be made to this statement, in the case of prolonged exposure to *red*; if this exposure is not simply long enough to give the complementary after-image, but is continued for a considerable number of minutes, the effect is to displace the point of maximum luminosity towards the violet.) This seems good evidence of the separateness of the luminosity and color senses. Another fact bearing in the same direction is that the luminosity curve of red-green blind eyes shows no constant deviation from the curve for normal eyes. The color-blind eyes so far examined do indeed show luminosity curves differing from that obtained from the majority of normal eyes, but the deviations are in some cases in one direction, in others in the opposite; and some eyes which are apparently normal in color vision have similar deviations from the curve obtained from the majority.

Professor J. McKeen Cattell reported an observation on "The Entoptic Fovea." The usual method of demonstrating the fovea entoptically, by looking through a blue glass or a chrome alum solution, fails with many individuals. But if the glass is removed after a few seconds, an after-image effect shows the fovea clearer than the background; and this is more readily seen than the effect while the blue screen is before the eye. The explanation of the effect is probably that the yellow spot absorbs much of the blue light, so that that part of the retina is less fatigued than the surrounding region.

Dr. Frederic Lyman Wells, under the title "The Tapping Test," communicated a study of the maximum rate of repeated voluntary movements during and at the limit of practise in one normal individual, with comparative reference to the performance in other

normal and in pathological subjects. The maximum rate has little, if any, relation to subjective feeling of efficiency. The practise curve shows less diurnal variation in its earlier than in its later stages. The general effect of practise from day to day is to increase initial efficiency, while the general effect of the "warming up" in a single day's work is to give relative immunity to fatigue. As a psychological measure, the maximum tapping rate is of little importance compared with the curve of the fatigue losses. The general interpretation of the tapping test is as yet far from clear; most of its phenomena, however, are probably of nervous rather than muscular origin.

Professor W. M. Wheeler gave an illustrated lecture "On Some Vestigial Instincts in Insects," in which he gave many instances of the reappearance, under unusual conditions, of instincts which had been active ancestrally, but had disappeared. An instinct which seems dead in the species may thus be resuscitated and serve a useful purpose.

Professor W. P. Montague read a paper on "The Addition of Intensities," in which he maintained that intensities are true quantities, since they are susceptible not only of the relation of more and less, but also of the relation of whole and part. The component parts of an intensive quantity are synthesized by "superposition," and not, as in the case of extensive quantities, by "juxtaposition." It is usually supposed that intensive quantities are simple and without parts. This misconception results from a failure to see that superposition is as truly an additive synthesis as is juxtaposition. The paper gave examples of the addition of several types of intensities, such as velocity, density, temperature and pain. The fundamental rule for the addition of intensities is: So combine the quantities as to keep the extensive factors of the whole equal to the extensive factors of each of its parts. For example, if two densities are to be added, the volume of the sum must be equal to the volume of each of the components. This could only be accomplished by superposing one volume upon another in such a way as to make them interpenetrate. The rule for adding intensities has its analogue in the rule for adding extensive quantities, according to which we are bidden to combine the quantities in such a way as to keep the intensive factors of the whole equal to the intensive factors of each part.

Professor D. S. Miller spoke on "Applied Philosophy and Applied Psychology," devoting himself mainly to the consideration of the various psychological methods by which habit and character can be altered. He mentioned, among such methods, practise, hypnotic suggestion, and attraction.

R. S. WOODWORTH,

Secretary.